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Editorial

Welcome to the 1980's

You will already have gathered that this first issue of the Journal for the 1980's heralds a change of style and layout, though this does not affect the standard of material published in it. The new cover, resulting from the competition held last year, was designed by Anne Bennett of Uckfield, Sussex, who has kindly consented to add her skills as a geotechnical draughtswoman to our journal production team, so doing much to enhance the overall appearance of the Journal. Also Dr Richard Thorpe, our erstwhile president, has kindly consented to act as co-ordinator of a panel of referees for technical papers submitted. Do not, however, let this deter you from submitting other work for publication as this last change is only aimed at ensuring a reasonable degree of accuracy in those papers written as full scientific papers, and will not apply to descriptions of sites or field trips. As will be seen from the inclusion of the very interesting *Anglesey A letter from the past*, other material of interest to geologists will be welcomed.

One area where I would like to see change is the inclusion of more self-explanatory field trip notes. I envisage these being based on the notes prepared for field trips, expanded in such a way as to allow anybody not originally able to attend to do the field trip whenever they are in the area. If you are organising a trip and could send me a copy of the notes so that others can follow in your footsteps I would be most grateful. There are many excellent guides to local geological sites which give an idea of what is required, so why not add your efforts to the lists of geological field trips?

If sufficient papers can be obtained, I would like to group papers into thematic areas, perhaps devoting a complete issue to one subject. To do this requires a good head of papers, and I would appreciate submissions from any members, or their friends and associates. Don't forget that extended TMA's can make useful papers, and will be of interest to other students. If you could send a copy to me at the address below I would be grateful. I would also appreciate the name and address of any potential contributor to the Journal, and any hints on how best to blackmail him/her into submitting an article!

Finally, an apology regarding the lack of articles in this issue. Partly this is because of the dearth of articles submitted, but it is also due to the need to include the constitution and annual report in this issue. There will be more articles next time – IF YOU WRITE THEM!!

Here endeth invective No. 1.

Martin Bryan

The OUGS Annual Conference – an unabashed advertisement

Early last July I went to the OUGS Annual Conference at Sheffield, and I was so impressed by it, and found it so rewarding, that I am now writing to encourage as many OUGS members as possible to attend the next conference.

The Sheffield meeting was the third one I've attended, and my impresssion is that they get better every year! That may be partly because I get to know more people each time, and partly because the Sheffield conference was opened by the Deputy Lord Mayor at a delightfully managed reception!

But I'm not trying to encourage myself to go again: I want to make sure that others go too. To take the most obvious and pragmatic reason first, people doing earth science courses at any level should go if they can. The lectures and discussions are always of a uniformly high standard, as well as being lively and interesting, and they alone provide considerable educational reinforcement – by which I mean I learnt a lot! And I know that everyone else who was there did too, because so many of them were saying so. The informal discussions over meals, drinks, coffee and tea breaks, and so on, are also an excellent means of exchanging news and views and, as there will always be two or more Walton Hall representatives attending, you also have the opportunity of commenting on past, present and future courses. In fact, one of the reasons I go to these meetings is to get that kind of feedback – and very valuable it is too.

So there you are. Come along to the next conference and you'll not be disappointed. The blend of educational experience and informal friendly enjoyment is hard to beat. I don't normally enjoy conferences, but I'm not going to miss the OUGS conference in Notingham this year, unless an Act of God intervenes. I hope I'll see you there.

John Wright
Earth Sciences Department
Walton Hall

The 1980 OUGS Annual Conference, entitled *From Asthenosphere to Crust–a symposium of igneous processes*, will be held at Nottingham University on 4th, 5th and 6th July, 1980. For further details see the booking form in the Newsletter enclosed with this Journal.

NEW LIGHT ON SKYE

Dr R. S. Thorpe

The *Igneous Case Study* on *The Tertiary igneous rocks of Skye, NW Scotland** emphasised that the various hypotheses for the origin of the Skye granites have changed as new techniques have been developed and applied. Since the *Case Study* was written in 1976, further techniques have been applied to the granites. Here we outline two which have modified the current views concerning the petrogenesis of the granites.

Rare Earth Element (REE) determinations

The REE are a well-defined group of 15 trivalent chemical elements of atomic numbers 57 (La) to 71 (Lu) which are collectively called the *lanthanides*†. Because their atomic properties are very similar, the REE behave coherently in many geological processes. The chief exceptions are Eu and Ce, which can exist in different valence states, such as Eu^{2+} and Ce^{4+}. However, although the REE do generally behave similarly in many processes, there are significant variations within the group. These variations are now well-known and can be used to study the origin of igneous rocks.

The absolute abundances of the REE vary with atomic number (even-numbered elements are generally several times more abundant than adjacent odd-numbered elements). Also the REE pattern in chondritic meteorites is thought to reflect the pattern in the Earth as a whole (The Bulk Earth). To study variations, therefore, REE abundances are generally divided by those in chondritic meteorites and shown on a plot against atomic number. An example of such a plot for samples of two Skye granites is shown in Figure 1. The *Igneous Case Study* showed that the Skye granites might result from partial melting of Lewisian gneiss or Torridonian sandstone, or by fractional crystallization of basaltic magma, or indeed by a mixture of both. Analyses of these materials for REE, together with a knowledge of how the REE behave in partial melting and fractional crystallization processes, might therefore enable a choice to be made between these hypotheses. In addition, the REE distributions in minerals are believed to be relatively unaffected by hydrothermal alteration. REE analyses of eleven Skye granites from the three centres, and six Lewisian and Torridonian rocks from Skye and Rhum are summarised in Figure 2. Although the number of Lewisian rocks is rather small, the large number of analyses of Lewisian rocks on the Scottish mainland suggest that these patterns are representative of the Lewisian as a whole.

* In the Open University S333 Earth Sciences Topics and Methods course

† A complete list of the lanthanides, with atomic numbers in parentheses is: lanthanum (57), cerium (58), praseodymium (59), neodymium (60), promethium (61), samarium (62), europium (63), gadolinium (64), terbium (65), dysprosium (66), holmium (67), erbium (68), thulium (69), ytterbium (70) and lutetium (71).

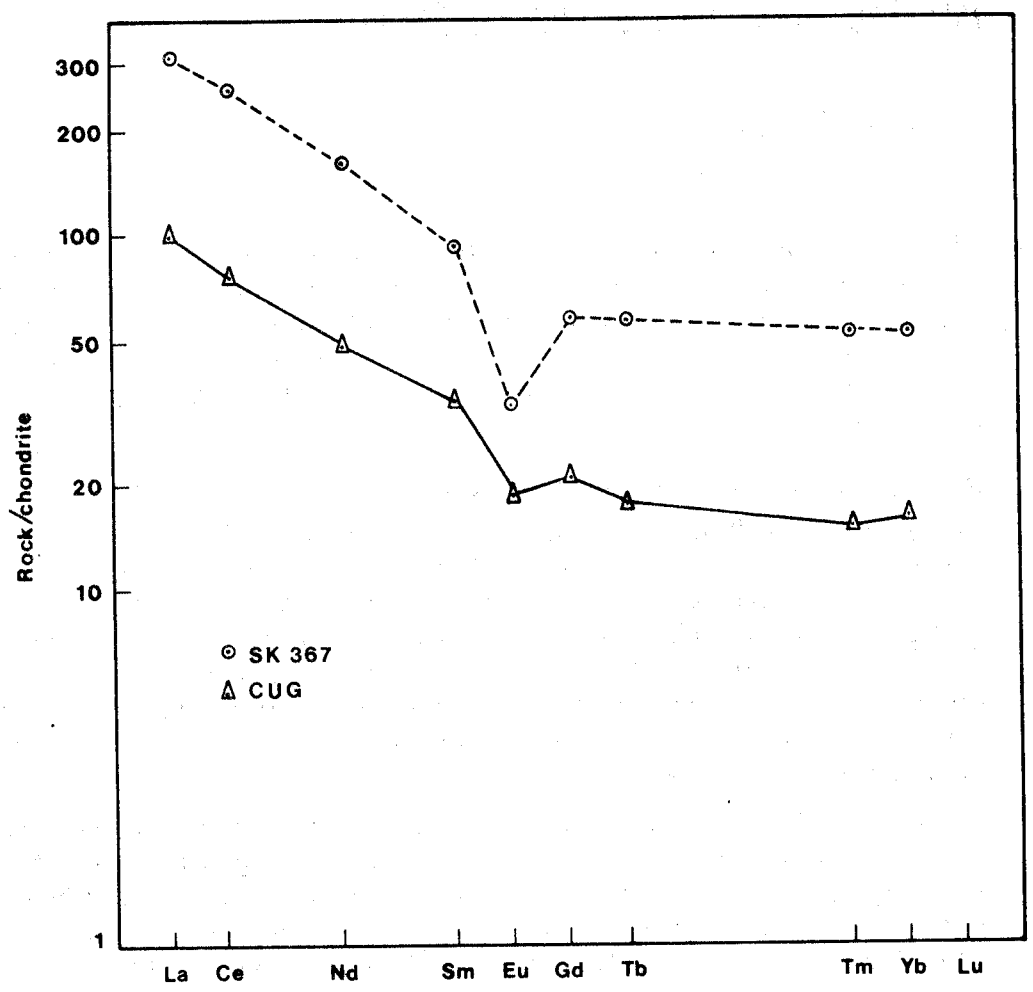

Figure 1 Chondrite-normalised REE plot for samples of the Coire Uaigneich granite (CUG; Cullin centre) and the Ruadh Stac granite (SK367; Strath na Creitheach centre). From Thorpe *et al*, 1977, Figure 1(a).

The first point to note from Figure 2 is that the fields of Skye granites and Lewisian and Torridonian rocks *do not overlap*. This means that *none* of the granites can be a *total melt* of Lewisian or Torridonian rocks. They might still, however, be partial melts since it is known from other studies that REE tend to become concentrated in the liquid phase during partial melting processes. The second point to note is that the REE patterns of the granites are less steep (and therefore proportionally less enriched in the light REE) than those of the Lewisian and Torridonian rocks. Since it is known that during partial melting the REE patterns either do not change or become *steeper* (proportionally more enriched in the light REE) in the liquid phase, partial melting still does not seem a plausible way of deriving the Skye granites from Lewisian or Torridonian basement.

Also shown in Figure 2 is a summary of REE patterns for basaltic rocks from Skye. During fractional crystallisation processes, REE patterns again either show little change or become *steeper* (i.e. more enriched in light relative to heavy REE). This is

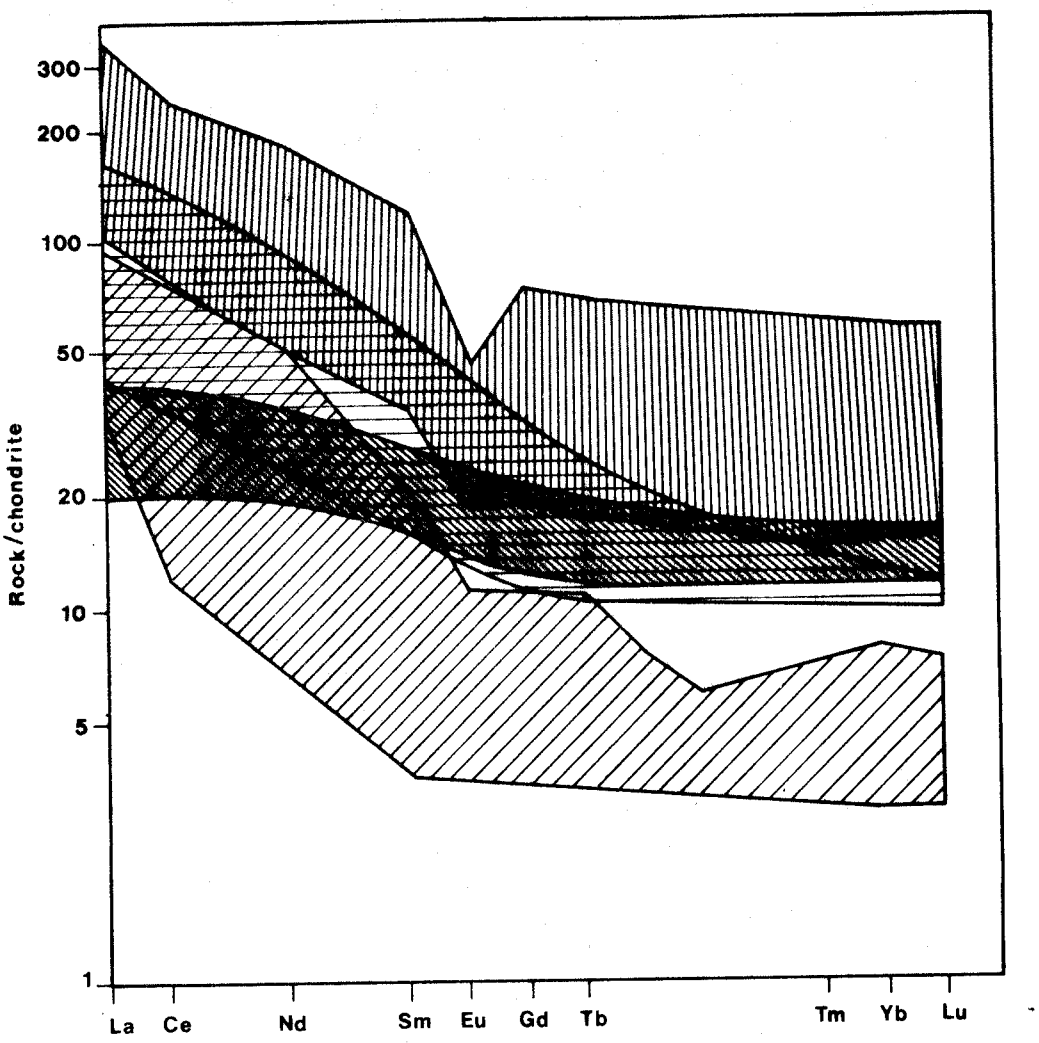

Figure 2 Summary of REE plots for Skye granites (close-spaced vertical lines), Lewisian and Torridonian (wide-spaced diagonal lines) and basaltic rocks (lavas and dykes; wide-spaced horizontal lines and close-spaced diagonal lines) representing different groups. From Thorpe *et al*, 1977, Figure 3, with data for basaltic rocks from Mattey, D. P., Gibson, I. L., Marriner, G. F. and Thompson, R. N. (1977) *Mineral. Mag.*, 41, 273-285.

analogous to the behaviour of REE on partial melting, but in a crystal-melt mixture the REE are concentrated into the liquid where they tend to have a steeper pattern. The relationship of the REE patterns shown in Figure 2 therefore indicates that basaltic magmas might be parental magmas for the granites, and this was the conclusion drawn from the REE determinations. Such a conclusion was, of course, opposed to the current consensus, which held that partial melting was more important.

Although the REE seemed to favour an origin by fractional crystallisation rather than partial melting, there are still some uncertainties. For example, although it is widely assumed that the REE patterns are unaffected by hydrothermal alteration,

this has not been conclusively proved. Another problem is that the REE in gneisses and granites are often concentrated in minor phases such as apatite, and we are not sure how these behave during partial melting processes. Finally, the Sr and Pb isotope evidence indicates that the Lewisian has contributed in some way to the formation of the granites. Accepting the REE data at face value, it was therefore argued that the Skye granites resulted from fractional crystallisation of basaltic magma but that the parent magma had been *selectively contaminated* with radiogenic Sr and unradiogenic Pb.

Samarium-neodymium isotope determinations

A relatively new technique that has been applied to the study of igneous rocks is that of samarium (Sm) and neodymium (Nd) isotope analysis. Both Sm and Nd are relatively light REE (see Figure 1) and both consist of a mixture of isotopes approximately in the proportions shown below.

^{144}Sm	3.09		^{142}Nd	27.11
^{147}Sm	14.97	$\xrightarrow{\propto \text{ decay}}$	^{143}Nd	12.17
^{148}Sm	11.24		^{144}Nd	23.85
^{149}Sm	13.83		^{145}Nd	8.30
^{150}Sm	7.44		^{146}Nd	17.62
^{152}Sm	26.72		^{148}Nd	5.73
^{154}Sm	22.71		^{150}Nd	5.62

Among these isotopes ^{147}Sm is radioactive and decays to form ^{143}Nd with a half-life of 1.06×10^5 Myr (equivalent to a decay constant of $6.54 \times 10^{-12} yr^{-1}$). Therefore the ratio of ^{143}Nd to other Nd isotopes in a rock is a function of the Sm/Nd ratio and age. This is analogous to the Rb/Sr system, where the $^{87}Sr/^{86}Sr$ ratio is a function of Rb/Sr ratio and age.

The change in Nd isotope composition, expressed as a variation in $^{143}Nd/^{144}Nd$, throughout the Earth's history is shown in Figure 3. The value of this ratio at the time of the Earth's formation is taken as 0.506 82 from a meteorite determination. Assuming that the Earth as a whole has a chondritic-like REE pattern, which would plot as a horizontal line at intercept = 1 on Figures 1 and 2, then the $^{143}Nd/^{144}Nd$ ratio would have increased to 0.512 62 at the present as a result of the decay of ^{147}Sm to ^{143}Nd. This increase is shown in Figure 3 and is referred to as the Bulk Earth (BE) evolution line. However, most samples do not have present $^{143}Nd/^{144}Nd$ ratios identical to that of the BE. Materials that have a *lower* initial Sm/Nd ratio than the BE, such as the Lewisian gneiss in Figure 2, will evolve a *lower* $^{143}Nd/^{144}Nd$ ratio than the BE. The present range in $^{143}Nd/^{144}Nd$ ratios for Lewisian gneisses lies around 0.511 and is shown in Figure 3. Conversely, materials which have a *higher* Sm/Nd ratio than the BE will evolve with a higher $^{143}Nd/^{144}Nd$ ratio than the BE. This characterises ocean floor basalts which have a REE pattern depleted in Nd relative to Sm (see inset in Figure 3). The higher $^{143}Nd/^{144}Nd$ ratios in relation to the BE indicates that the parent materials for these basalts must have been characterised by a light-REE depleted pattern for much of Earth's history.

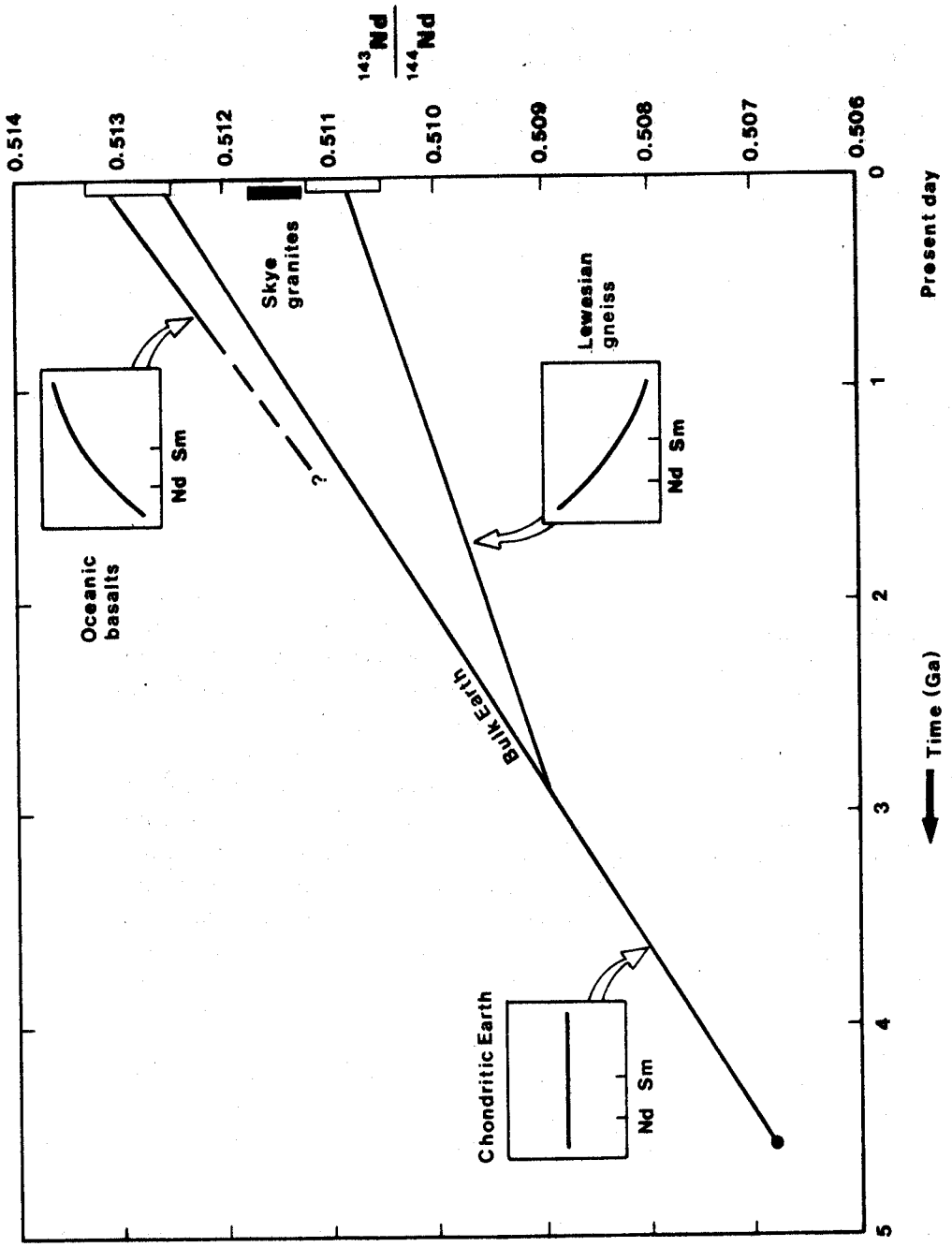

Figure 3 Change in Nd isotope composition, shown as a variation of $^{143}Nd/^{144}Nd$, in the Earth's crust and mantle throughout the Earth's history. The Bulk Earth is assumed to have a chondritic Sm/Nd ratio (0.308) and to have developed from material with an initial $^{143}Nd/^{144}Nd = 0.506\ 82$, such that the present $^{143}Nd/^{144}Nd$ ratio is predicted to be 0.512 62. The range of Recent oceanic basalts is indicated; they are seen to be largely derived from source regions with *higher* Sm/Nd than the BE (i.e. depleted in light REE on a chondritic-normalised plot – see inset). The continental crust has evolved with a Sm/Nd ratio *lower* than the BE (i.e. enriched in light REE on a chondrite-normalised plot – see inset) as illustrated by the line that corresponds to acid and intermediate Lewisian gneiss formed at 2 900 Ma (Lewisian data from Hamilton, P. J., O'Nions, R. K., Evensen, N. M. and Tarney, J. (1978) *Nature*, 277, 24–28. The range of $^{143}Nd/^{144}Nd$ in Skye granites is indicated from Carter *et al* (1978).)

Recalling the possible origins of the Skye granites, it would seem a relatively straightforward matter to determine $^{143}Nd/^{144}Nd$ ratios for Skye basaltic rocks, granites and Lewisian gneiss to determine whether the granites were formed by fractional crystallisation or by partial melting. Such measurements were reported by Carter *et al* in 1978 and are summarised on Figure 3. The $^{143}Nd/^{144}Nd$ values for the granites lie *between* those of the basaltic lavas and the Lewisian gneiss! So the Nd isotope data indicate that the granites plotted on Figure 3 cannot have originated *either* by fractional crystallisation of the basaltic magma *or* by partial melting of Lewisian gneiss (cf. Moorbath and Welke, 1969). Carter *et al* summarised the Nd and Sr isotope data and concluded that:

> It is clear from these relationships that the intrusive rocks were not derived entirely from either a mantle source or the Lewisian amphibiolites; approximately 50 to 75 per cent of the Nd and Sr in these intrusive rocks is derived from the amphibiolites, while the remainder is of mantle derivation.

Conclusion

At the end of the *Igneous Case Study* we made several remarks about the origins of the Skye granites. We implied that the major process responsible for the origin of the granites was partial melting of Lewisian and Torridonian rocks. What do I think now? Although even more is known about the granites, the origin is still by no means agreed! It does seem, however, that another consensus *might* be emerging. Most researchers now agree that the granites cannot have originated *entirely* by fractional crystallisation of basaltic magma, or *entirely* by partial melting of Lewisian or Torridonian rocks. *Both* fractional crystallisation and partial melting must have occurred. Noting that some basaltic lavas, including those of Skye, must have been *selectively* contaminated with elements such as Pb, Sr and Nd (and presumably the other REE), the granites *might* have originated by fractional crystallisation of such *contaminated* basaltic magma. In this case the crustal component might be relatively small (perhaps 10 per cent). Alternatively, the isotope evidence might be taken as a direct indication of the amount of crustal material involved, for example 50-75 per cent is indicated by the Nd and Sr isotope data. Being impressed by the evidence for selective contamination of continental volcanic rocks elsewhere in the world, my present bias is towards a model based on fractional crystallisation of contaminated basaltic magma.

References

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Moorbath, S. and Welke, H. (1969) Lead isotope studies on igneous rocks from the Isle of Skye, Northwest Scotland. *Earth Planet. Sci. Lett.*, 5, 217-230.

Thorpe, R. S., Potts, P. J. and Sarre, M. B. (1977). Rare earth evidence covering the origin of granites of the Isle of Skye, Northwest Scotland. *Earth Planet. Sci. Lett.*, 36, 111-120.

See Page 13 for the Acknowledgements.

Anglesey – A letter from the past

Recently I had the good fortune to obtain a small correspondence addressed to Henry Pritchard of Anglesey, covering the years 1837 to 1840, amongst which were several letters which might interest members of the O.U.G.S. I have copied out the relevant portion of one of them below complete with anachronistic punctuation (or lack of it!). This particular letter is headed "At the first General Meeting of Shareholders of the Anglesey Mining Company, held at Amlwch, on the 15th Day of December, 1836". Any Postal History buffs reading this may like to know that the postmarks on the outer wrapper comprise a small blue "No. 5" applied at the Amlwch Receiving House of the local post, an italic "Bangor Penny Post" in red, and the Bangor datestamp of 15th January 1837.

Most of the extract is self explanatory, and the references to the indications of the presence of minerals by "gossans, cuperous water and sulphureous peat" are particularly interesting to anyone who has done S266! The occurrence of "veins of paint" is a puzzle though – perhaps this was some material which was used as a pigment at the time.

One other letter in the correspondence, headed "Parys Mine 23rd June 1840", makes a passing reference to an occupational hazard of mining with the brief statement that "a boy was killed at Mona Mine yesterday. Fell down a shaft."

Malcolm T. Mynott

The first Report of the Sub-Committee of the Anglesey Mining Company, laid before the Shareholders, the 15th day of December, 1836.

According to the promise in our Report of the 17th November, we lay before you the information we have obtained from John Jones and others, as well as what we ourselves have had the opportunity of seeing, respecting the Mineral lodes, and other substances in this county.

Llanelian Mountain and Parish

To the east of this mountain we find there are several lodes visible, and strong indication of others, and from their appearances, as well as the direction they take, we conclude they are a continuation of the Parys Mountain lodes, we find them on the shore, and can follow them below the Telegraph, through Tros y my nydd, the property of Mr Hugh Hughes, on to a farm now held by Edward Rogers, then to Croesa, on to Cerrig y bleiddia and Parys Mountain (See Specimen No 32). Foulk Jones made some trials on one of the lodes about 40 years

back, and some of the Shafts are now to be seen (See Specimens No 15 and No 16) from a large lode of Spar. To the north of the Mountain, near Porth y Cowgel, there is a change in the strata, a kind of shale comes in, in which is a lode ½ yard wide, to be seen with its regular dip, for 10 yards, up the Cliff, and for 20 yards in length (See No 8). A little further south, there is a lode one yard wide, from 10 to 15 yards high, to be seen for 10 yards in length (No 33). These Specimens, with what is stated respecting the lodes, should receive particular attention, as it has been said by some, that the Parys Mountain lodes cannot be found in Llanelian Parish.

The shale continues on the Sea Coast, with a mixture of Spar to the Old Workings of Foulk Jones, to which we have before alluded. There are other veins in different parts in the side of the Hill, but not of so much importance in appearance as the lodes which we have before spoken of.

West of Parys Mountain, Amlwch Parish

From the northern part of the mountain we cannot expect to trace any of the lodes, as the land for a great distance is either Marshy or covered deep with soil, the first indications appear from Trials made by Mr Owen Jones of Gwedog, near Nantglyn. There is also shale found further South, joining Glasgrig, very much like that for Parys Mountain, and likely to be the same run. At Pembolisa there is a lode of Iron Stone, Spar etc. (No 5), it appears to be 4 feet wide, but no trials have been made thereon. At Pembolucha, the same run of Shale and Iron Stone continues to Llanbabo, and if Cupreous Water and Sulphureous Peat are indications of a Mineral Country, they are to be found at Cae Mawr and Fferamucha Llanbabo.

We are not quite satisfied as to the direction of this great lode from Llanbabo; some suppose it goes to Clwch ŷ dernog, on towards Peurhyn Llanfurog, as the same kind of Shale is to be found there, only it lies quite flat, there are veins to be seen all the way, on which small trials have been made; there is evidently Copper mixed with Sulphur at Clwch ŷ dernog and Ynys ŷ gwiddel; from the latter place many tons were raised about 30 years back, and in the present year a small quantity was sold at the Mona Smelting Works. There is also a course of Gossan, 3 feet wide, for half a mile in length, in the Parish of Llanrhyddlad, which is considered to be the same course from which the Copper, before spoken of, was raised.

Some Shale, Copper and Sulphur have been found at Risart, South of Holyhead Mountain (See No 20), there are some old Workings now to be seen on the Sea Shore, and the lode, which is from 4 to 18 inches wide, can be traced several yards — also in Mr Lickstones' land at Cleifiog, it is said there is a vein in the Marsh, and formerly good Copper was raised from thence. Specimen No 21 was dug from this place. Various lodes and small veins are now to be seen in the Land of Mr Edwards of Nanhoran, part of which is now in course of working, by Messrs. Paynter and Co. at Gadur in the run of this land, there is some ground considered to be promising, called Cfndybach: a lode is to be seen 2 feet wide (See No 12).

At Llanlliana, Porth y Cynfor, there is a lode full 18 inches wide, mixed with Quartz, and some rich Copper, and in some places fine lumps of Gossan are to be found, and on each side of the lode, Shale no. 1 at Risart, there are old workings; here a level is driven for 12 or 13 yards, but not far enough to intersect the course; the same lode may be seen in a large cave 50 yards long, lode 2 feet wide, and the roof tinged all over with Sulphate of Copper or Verdigris (No 2) it is thought by some, that this lode can be traced for more than half a Mile in length.

At Clygyrogucha there is a course 6 inches wide, (No 19), the water overpowered the former Company, which forced them to abandon it. At Llwydiarth, there is a lode of Sulphur 6 inches wide (No 27) which can be seen 30 yards on the surface. At Maenhir there is a small vein of Copper 4 inches wide in hard ground, there is a small hole made in this vein now filled with rubbish, in which, it is said, the vein is much better than what it is on the top (No 34).

By Edward Prichard, Miner, we were informed that there were some promising lodes, at or near Gwalchmai (No 22) and to prove what he said, we sent our man, who brought sample no. 22 from the same place, dug from a pit half a yard deep, in a farm called Camddagytfan (Mr Meyrick's Land) -- there is Gossan and Sulphur attached to the North part of the lode, supposed by some to be a good omen; Edward Prichard has traced this lode for a great distance, he found it in the land of Mr William Hughes, who has promised him a take-note for the Company.

On the island of Ynyrcadnant, in the Menai, there are three lodes to be seen; on the East side there are two, half a yard wide each, full of Spar, with flecks of Lead and Copper (No 24) -- but on the West side there has been some Copper raised; but as they opened the lode to the Sea, the water came in and filled the work.

Some Liverpool gentlemen have a work on the Island, where Llandisilio Church stands, they have raised some tons of Ore from it, and most likely they are the same lodes on both islands.

At Llanddona, there are various old workings, which look poor in sight, but there is a course very near the same place, in the land of Mr Jones of Beaumaris, one foot wide, in the roof of an old level, which looks more kindly (No 17) – There are many old workings in this district, principally in Mr Meyrick's Land; to the East on the shore, in one part of the cliff, we are informed, there is a very fine loose Gossan, that cannot be surveyed by any other means than that of a Boat from the Sea.

Coal has been found in many places in this part of the Country, and there are very strong indications in other parts -- At Hirdefraig, a Shaft was sunk 7½ yards deep and it is said, that the Company that sank the Pit, were very sanguine of success, until the water mastered them. At Henblas there is a small vein visible in a Quarry, accompanied with Grit Stone and Shale (No 30).

Paint veins have been discovered in the land of Holland Griffith Esq., one of them, four feet wide, has been worked lately by Owen Rowland and Co. The shaft through which they draw the paint, being so near the Sea, they were conquered by the water.

At Llanrhyddlad there is white Clay and Yellow Ochre (Nos 10 and 11). At Whylfa, on the Shore, the vein is 10 yards wide, Rock on each side, (No 4).

Iron-Stone is to be found at Llanrhyddlad, 2 yards wide, and 2 yards high, going into the Land (No 9). At Porthwen, there is a vein of Iron-Stone, 2 feet wide, to be traced regularly over some distance, with a beautiful white Clay.

Having closed our remarks on the Mineral appearances, to which our attention has been called, as far as we are able to judge, we consider them to be true. We admit that this report might have been consideably abridged, and to the Shareholders have been quite satisfactory, but as this is the first General Meeting of the Company, we considered it most advisable to set forth, as far as we can, the facts stated in this prospectus, — that this Island abound with Minerals, and that the Shareholders present may be better prepared to decide on the places to commence their operations.

The places we beg to recommend to begin at, are at Llanlliana, (Lord Dinorben's Land), at Maenhir, belonging to the Trustees of Beaumaris School, at Llanelian Mountain, in Lord Dinborben's and Sir John Stanley's Land. At Gwalchmai, and in sundry Gentlemen's Land, as stated in a paper by Edward Prichard, and also to employ a man or two, in searching here and there, in such Land as the Agent may approve of.

C. H. Evans
R. J. Griffith
James Treweek

P.S. The Lands named by Edward Prichard are at Bwlch y fen, Bodwina, Brynlewi and Llain y delin.

A Study of the Geology of the Dorset Coast

The University of Birmingham is holding a weekend field visit, based on Swanage, on 17th and 18th May, with an optional briefing meeting at the University on Friday 9th May. The programme covers the coast line from Durlston Head to Studland Bay near Swanage on Saturday, and Durdle Door to Lulworth Cove on Sunday. The cost is only £3, but you have to arrange your own accomodation, food and transport. A list of hotels, youth hostels and camping sites can be had on request. Starting time is 9.30a.m. on Saturday.

Norma's Last Tome

(as Editor)

The production and distribution difficulties with which the year began were due to a combination of factors. One was a new system introduced by OUSA for publication work, which involves a six to eight week notification period. This has been resolved by drawing up a regular submission and distribution schedule. However, it is always understood that OU student mailings take priority over societies, etc, and so on occasions 'hiccups' in the system may still occur. Another problem was the delay in postal services due to the weather problems and transport holdups. There are still localised delays in postal services, but these are entirely beyond our influence. The only advise is that suggested by the GPO – if your mail has been delayed as indicated by the postmark write to complain to your area Head Postmaster. Most of the credit for the general improvement in the publication of the Newsletter/Journal must go to Marion Hughes at OUSA, who was appointed early in the year and who has been most helpful. I owe her many thanks.

The new format of newsletters plus three journals seems to have been well received – or perhaps I have just not heard from dissatisfied readers. However, there is still not enough copy being submitted, as opposed to extracted (hear, hear – Ed). That brief article or project you've thought about sending is good enough you know, and it looks even better in print.

Most of the articles for the last two journals were typed by our typist, Jenny Morrison, to whom our thanks for a very good job.

The competition for a new cover design brought a number of very good, interesting entries and we would like to say 'Thank you' to everyone who took so much time and effort. The one chosen, designed by Anne Bennett, graces the cover of this issue. Well done Anne.

The last newsletter for 1979 contained the results of the AGM and membership renewal forms. If you haven't already returned this, your last membership form for this year is in the Newsletter accompanying this Journal.

And now may I say 'Thank you' to all those who have helped me in so many ways whilst I have been your editor: contibutors, Walton Hall staff, the executive committee and particularly the Branch Organisers who have worked so hard to get dates of field trips in early, etc. To my successors I offer my very best wishes for the future.

Norma Rothwell

Acknowledgements for *New Light on Skye*.

I am grateful to Drs. G. C. Brown, S. A. Drury, C. J. Hawkesworth and G. A. Yarwood and Prof. I. G. Gass for helpful comment. *New Light on Skye* was the title of the Presidential Address given by Richard Thorpe after the 1979 Annual General Meeting of the OUGS.

Branch Reports

The West Midlands starts at Ercall!

The first field trip/meeting of the newly formed West Midlands branch got off to an encouraging start on November 18th when fifteen members from as far apart as Newport and Crewe ascended the Ercall and Wrekin in central Shropshire.

Starting at the Forest Glen Quarry, we observed the rhyolites, ashes, tuffs and conglomerate of the Precambrian basic volcanic group, and even found one of the two dolerite dykes from the drill holes made to obtain samples for radioactive dating! Unfortunately the margins of the dyke were very hard to ascertain, and the position of the second dyke was also a bit evasive. Banding of the rhyolite and some flow features in the tuff were noted, though better examples of both were to be found later. From Forest Glen we went to look at a small disused quarry in the granophyre intrusion, before returning to the working quarry on the south side of the Ercall to see the Cambrian Quartzite where it adjoined both the volcanics seen at Forest Glen and, further up, the Comley Sandstone. The quartzite was badly weathered lower down, but in the higher quarries showed nice cross-bedding and other features, despite its age and metamorphosed state.

After a lunch break at a local hostelry, where future branch activities were discussed, we went to Maddocks Wood Quarry on the other side of the Ercall to see the rare Camptonite intrusion into the near vertical Cambrian Shineton Shales. Whether this intrusion was originally a sill which has been turned vertically with the shales, or whether a dyke intruded after the upheaval is uncertain. Some graptolytes were found in the surrounding shales.

From Maddocks Wood we returned to Forest Glen for a stroll up the Wrekin to observe the flow banded rhyolite near the summit, where a good view of the surrounding geology was obtained despite the waning light. All in all (there was no sign of rain!) a most auspicious start for the West Midlands. If you live in the area bounded by Anglesey, Aberystwyth, Gloucester and Stoke-on-Trent or want to know more about the West Midlands branch, contact David Franks in Wellington (see address on inside back cover).

Shap Map – The East Midlands and Oxford branches' Lake District trip, May 1979

When the trip to the Lake District was planned and Geoff Brown gave a preliminary lecture in October 1978, we asked if it would be possible to include a mapping exercise during the three days. Mapping seemed to be fundamental and we had done it so rarely. Thus were our hopes sitting in that warm and comfortable room!

Our enthusiasm in that warm room had undergone a subtle change when we were settled in the hotel in Keswick and we discovered that we were to map the Shap

Granite contact. Geoff had chosen this project because it was comparatively simple in that it was self-contained and small-scale. There were two rock types, easily distinguished by colour, and yet most of the problems encoutered by the mapping geologist would be experienced.

After a pleasant picnic lunch in the sun at the Shap Wells Hotel, we drove up onto Shap Fell. The weather was different here; there was an icy wind blowing, dark clouds swept above and snow stung our faces as we walked to the first contact. The plan was to split the group into four, with a complete range of experience in each: there were students from S100, S23, S333 and beyond, and these were equally distributed. The outcrop of the Shap Granite is roughly circular, as Geoff had discovered from geophysical studies. He planned to leave two groups at either side of the periphery, on a contact, and then they would work away from each other to map the contact, each covering a quarter of the circle.

The first contact was in a stream on the northeast side and the second was on a hillside to the southwest of the red Shap quarry. During the course of that bitterly cold Spring day we students did indeed experience many of the difficulties, disappointments and feelings of despair encountered by the mapping geologist. It is one thing to be taken to appropriate sites and shown the geology there, exposed in worked faces or in river banks or cuttings; quite another to look at an expanse of heather clad moor and ponder on the rocks beneath the peat. All our misgivings and inadequacies were confirmed as we searched for another contact to set us on our way.

It would take too long to give a verbatim account of the four groups, so I have selected some of the problems we found and how we dealt with them. The most important aspect of a mapping exercise is exposure. The Shap Fell resembles an enormous roche moutonnée and though this was only clear afterwards, it was very important to realise the part ice had played with the exposures. Everywhere there were red herrings in the form of erratic boulders and, near the quarry, man had added to the chaos by dumping waste rock on the contact. Where streams flowed from the fell there were exposures in the banks, and here the contact could be seen clearly. Other mapping techniques, such as change in slope, were not too helpful since the ice had smoothed both the granite and aureole similarly. Change in the vegetation was useful, with grass growing eagerly on the baked volcanics. In fact, the wire fences often seemed to lie along the contact. This was particularly useful because the fences were marked on the maps and the problem of pin-pointing a contact position was thus facilitated. Navigation was hardly something which we had envisaged as a problem, but it was. Apart from fences and streams, Shap Fell was a huge and featureless expanse. Such landmarks as 'Grey Bull' or the 'Rocking Stones' could have been any of three or four country rock exposures. Had we thought, we could have used our clinometers for triangulation to mark positions.

The groups fanned out to search for the contact when it disappeared beneath the peat or meadow, and though individual group contact lines seemed erratic, when the master map was prepared during de-briefing that evening, the four lines of contact showed a tendency to line up in a most convincing way.

Though we did not produce the ultimate map of the Shap Granite exposure, we all felt that our misgivings had been misplaced. Mapping did present problems, but by methodical observation it was possible to produce some worthwhile work. It had been a most stimulating, if arduous, afternoon, and had proved a useful preliminary study for future mapping work.

Jane Randle

N.B. There is a follow-up trip to this exercise during 1980. Hopefully Geoff Brown will be persuaded to run both these trips again during 1981/2. How about if Geoff?

Ed

West Country Report

In April we visited Middle Hope, just north of Weston-super-Mare, to see the rare Carboniferous Period volcanics of the region. Dr. D. L. Speedyman of Bristol University described the gradual onset of volcanic activity indicated by tuff horizons alternating with limestones and shales. The proportion of tuff increased to culminate in a five metre thick pillow lava, the upper part of which contained amygdales up to 8cm long, elongated in the direction of flow. Consequently, the proportion of tuff decreased. Three exposures show that the overall thickness of tuff deposits is reduced to the east, indicating a source of volcanism westwards. The sea into which the lava flowed was of shallow depth, shown by the highly fossiliferous and extensively burrowed sediments, some of which were reef corals. Numerous beds of chert are found accompanying the ash fall deposits. At Spring Cove nearby, a submarine lava flow of slightly younger age is exposed for 200m, with a total thickness of 15m. The lower part is of pillow-lava type, but above this is a brecciated zone composed of blocks of lava, an auto-breccia. This is followed by pillow lavas again. The whole thing ran down a slope and it would appear that the top of the cooling flow brecciated and slid, or was pushed, off in a similar manner to a sub-aerial flow.

In June we travelled with Dr. B. P. J. Williams by coach to Swansea, where Prof. 'Dickie' Owen joined us to lead the party to Gower. As usual with the Professor it was difficult to keep one's mind on the geology of the moment as every turn of the road produced some fresh story. But always we were brought back unerringly to the Structure and Stratigraphy of Gower. Walking up the slope of Cefn Bryn (Devonian O.R.S.) and through Broad Pool, more a swamp, he told us it was probably a swallow hole filled with boulder clay. Our raised eyebrows were quickly lowered when the Prof explained that the Cefn Bryn thrust lay hereabouts and the hollow was actually in the Lower Limestone Shales of the Carboniferous. We did this bog-slog to visit Arthur's Stone (megalithic, c2500BC), a 30 ton, exotic, coarse conglomerate cap-stone. Not being real geology our Welsh leader could really let himself go on this one!

The highlight of the day for S333 students was seeing the Modiola Group, a calcite-mudstone series of shales and fine grained, compact, porcellanous limestones laid down on an eroded surface. This has long been recognised as a 'lagoonal' environment. The facies both below and above in the Carboniferous limestone are highly fossiliferous, of shallow marine type, but the fossils in the Modiola group are completely different. Worm-burrows, faecal pellets, ostracods and a variety of algal growths are found. It is now recognised as a fossil sabkha, and laminated stromatolites are common. The limestone beds are frequently brecciated and collapsed into the underlying shales. This is because evaporite minerals and dolomite has been replaced by $CaCO_3$ and chalcedony, so producing a volume reduction. Pseudomorphs after gypsum are common.

We went to various quarries in July with Ian Ford and Chris Alabaster to look for rare minerals which Chris had been finding recently in the Mendips. We had to take Chris' word that he found some, although he could produce some pretty colours from them with a portable laboratory the size of a matchbox. The following week we examined the Dolomitic Conglomerate (Formation – not dolomitic – not conglomerate) at Clevedon. This is a fossilised breccia piled up against cliffs. It can be quite distinctive in size and shape of clasts, petrology and cement within a few metres. It was interesting to see rare ripple marks and dune bedded patches of sandstone amongst it.

On December 9th we began work with the Nature Conservancy in Vallis Vale re-exhuming another piece of exhumed landscape. This is a most attractive steep-sided valley, once the site of several ironworks, which used the brooks which stream off the Mendips (Beacon Hill) as energy source. The industrial archaelogists are having a difficult task looking for the remains which are buried amongst the dense vegetation. The cliffs feature a remarkable unconformity of Mesozoic over Carboniferous, which was made famous by De La Beche in the first memoir of the Geological Survey (1846). This too is hidden by dense vegetation and a little judicious clearing is called for. If you would like to help, a further site-clearing trip has been arranged for June 22nd. Meet at Hapsford Bridge, near Frome, Wilts (GR ST761497) with a spade, matchet, stiff broom, etc.

Wessex Branch

In October, five members visited the Bournemouth Natural Science Society's Museum in Christchurch Road. Mrs. Taylor, who is in charge of the geological collection, showed us many well-preserved examples of Tertiary fossils from the local area. The Dent collection, housed here, is one of the foremost in the country. Paul Clasby is working here on vertebrae thought to be from a crocodile! There are also samples of leaves from the Bournemouth Beds. These would undoubtably repay study by an expert on the subject. Mrs. Taylor has set herself the herculean task of collecting a sample of every rock in Britain, and we hope to visit the museum again to see these in more detail! The mineral collection is comprehensive, and students are welcome to contect Mrs. Taylor to arrange a visit.

At the AGM on November 10th, we had a reasonble turnout of six members, with two visitors for the lecture. Jo Thomas was re-elected Branch Organiser, in spite of not being a current student. Being a current student tends to take up too much time! Geoff Yarwood, the O.U. Earth Science Tutor for the South Region, gave a lecture on 'A Stratigraphy Reversed – an excursion to Northern Greece', which was an account of his Ph.D. studies near Mt. Olympos. In explaining his own studies he showed us that the previous papers on the area were not to be relied on, and that the British and French geologists today could not agree on the direction of movement on a fault – a neat example for that 'Methods and Consenus' unit in S333. The detective work involved in mapping such a complicated area, and dating the earth movements which have led to the apparent reversal of stratigraphy, was most revealing.

North West Activities

Our 1979 programme came to its climax on Friday 9th November with our After Exam Party. Nineteen members and friends from other science disciplines dined at the Danish Food Centre in Manchester, where the big attraction is the unlimited amount of food available from the 'cold' table. Some members demonstrated their immense capabilities in fields other than studying geology! The meal was followed by a late night party at Oneta's.

Our 1980 programmes opened with two other indoor events. On Wednesday 16th January the Museum of Mining in Buile Hill Park, Salford, opened in the evening specially for us. Ten members and friends enjoyed conducted tours around life size reconstructions of drift and shaft mines, a film on the history of coal mining and a preview of coal mining exhibits not yet open to the public.

On Saturday 26th January ten members visited the Institute of Oceanographic Sciences and Bidston Observatory near Birkenhead. Dr. R. Edge explained the work of the Institute and some of the equipment used both past and present.

Ron Whyman

Yorkshire Branch Report

Although we had planned to hold our A.G.M. in Fairfax House, Leeds, when we duly arrived at 7.30p.m. on Friday 18th February, the building lights were off and the doors firmly locked against us. We stood outside the building until 7.50p.m., at which time we decided to leave a note for any late comers and repaired to the bar of the Merion Hotel, where with the assistance of a couple of beers and *free* nuts and crisps we settled to the evening's agenda.

Details of the field trip programme planned are given in the Newsletter. The details of the weekend in Ludlow/Church Stretton have yet to be finalised, but if you would like to join us for that weekend please contact me by phone or letter. It is expected that a limit may have to be placed on numbers, so places will be on a first come first served basis. Arrangements are being made for an O.U. part-time geology tutor to lead this trip.

John Davenport

East Midlands Branch

At the Annual General Meeting of the Open University Geological Society, East Midlands Branch, on 18th January, 1980, Steve Penn announced his intention of giving up the leadership of the Group, due to pressure of other commitments.

Since 1978 the Group has attracted 60 members, and due to Steve's efforts the programme of lectures and field trips has been very comprehensive, with something to suit most geological tastes. August 1979 saw one of his most ambitious trips becoming a reality, a week long visit to study the geology of Iceland – a trip that, needless to say, was thoroughly enjoyed by all concerned.

On behalf of the East Midlands Branch Steve was presented with a pair of binoculars in appreciation of his hard work and dedication. The position vacated by Steve has been taken by one of the committee members, Jack Fryer, under whose direction the 1980 programme, which is in the last stages of planning, will be finalised. We wish both Steve and Jack well in the years to come.

OU Geologist's Devil's Dictionary

(with apologies to Ambrose Bierce)

Strike Measured by geologists downing clinometers. A sort of lucky dip.

Dip The fastest way down.

Apparent Dip The surest way down.

Fault A reason for going down. A confused area that tutors are not liable to overlook.

Reverse Fault A confused area that students have difficulty understanding.

Slippage Movement beyond our control (particularly to TMA delivery dates).

Bed Layer.

Bedding Plane (pronounced Bed-in-plane) The top, or bottom, of the layer (often too high up to reach without a plane!).

Trilobites Three dimensional pre-TV snacks.

Horse A large mass of *country rock* enclosed within a mineral vein. (If you don't believe me see the *Penguin Dictionary of Geology*!)

The Devil's Dictionary concept appeals to many people whose sense of humour is as warped as mine. If you also have this mark of a true geologist I would welcome contibutions.

Martin Bryan

OUGS – or not O.U.G.S.

If you look very carefully through this issue you will find that I've mixed my OUGSs with my O.U.G.S.s. The latter version, used on the folios, is the technically correct version, but comments like O.U.G.S. Annual Conference do not look right. I'd appreciate hearing from you which you prefer. If one version proves more popular than the other I'll stick to that. Otherwise I'll carry on mixing it!

CONSTITUTION OF THE OPEN UNIVERSITY GEOLOGICAL SOCIETY

1 NAME

1.1 The Organisation shall be called the Open University Geological Society (and may be referred to as the O.U.G.S.).

2 AIMS

2.1 To promote interest in Geology, especially among members of the Open University.

2.2 To sponsor the formation of Branches.

2.3 To support the Branches in their activities.

2.4 To arrange an Annual Conference.

2.5 To establish and maintain good relations with organisations having common interests.

3 MEMBERSHIP

3.1 Membership shall be open to all members and one-time members of the Open University.

3.2 Associate Membership shall be open to any other persons.

3.3 Family membership shall be available for any other adult, named persons of a member's family residing at the same address.

4 SUBSCRIPTION AND FINANCE

4.1 The Society Financial Year shall be from 1st October to 30th September the next year.

4.2 Members, Family Members and Associate Members shall pay an Annual Subscription, to become due on the first day of January each year.

4.3 The Annual Subscription shall be £2.50, or an amount to be decided at the Annual General Meeting, and shall become due in January each year.

4.4 The Annual Subscription shall be paid to the Hon. Treasurer.

4.5 Any Member, Family Member or Associate Member whose subscription is not paid by the last day of March for that year shall cease to be a Member.

4.6 Each Officer and Branch Organiser shall keep a record of accounts.

4.7 The Hon. Treasurer shall prepare a statement of the overall accounts and an audited version shall be presented at the A.G.M.

4.8 The O.U.G.S. shall have the power to raise funds from other sources.

5 GOVERNMENT OF THE SOCIETY

5.1 Government of the O.U.G.S. shall be carried on by:

The President and the following Officers:
- Chairman
- Hon. Secretary
- Hon. Treasurer
- Hon. Conference Secretary
- Hon. Publicity Secretary
- Hon. Editor
- Hon. Membership Secretary

5.2 The Officers shall be elected from among the Members of the O.U.G.S., by consenting nomination of two Members and by majority vote at the A.G.M., to serve for one year and be eligible for re-election, except for the Hon. Conference Secretary, who shall be appointed by the National Committee at an appropriate time.

5.3 There shall be a National Committee consisting of all Officers together with Branch Organisers.

5.4 The Officers shall act individually or collectively as an Executive to deal with routine matters within the terms of reference given by the Society and in accordance with the Aims of the Society.

5.5 When a vacancy occurs by reason of resignation, disqualification or death of an Officer, a replacement shall be appointed by the Executive to fill the vacancy until the next Annual General Meeting, at which the replacement shall retire and be eligible for re-election.

5.6 The Society through its executive shall be empowered in exceptional cases to offer a position of Hon. Vice President to such person or persons who have performed outstanding service to the Society.

6 PROCEDURE AND BUSINESS

6.1 There shall be an Annual General Meeting in November each year.

6.2 The Hon. Secretary shall give eight weeks notice in writing to all Members of the date, time and venue of the meeting.

6.3 Officers, National Committee, Branches or Members shall give the Hon. Secretary at least six weeks notice in writing of any motion, proposal or matter they wish to have placed on the Agenda for the A.G.M.

6.4 The Hon. Secretary shall send out the Agenda for the A.G.M. at least two weeks before the meeting to all Officers, Branch Organisers, Members and Associate Members. Amendments to motions may be submitted before or at the meeting.

6.5 All Officers shall retire at the A.G.M., but be eligible for re-election (see 5.1 and 5.2).

6.6 A Member may not hold the same Office for more than 5 years consecutively.

6.7 The Auditor shall be appointed at the A.G.M. for the next year.

6.8 A Special General Meeting may be called at the request of the Executive or three Branches.

6.9 Within two weeks of receipt of the notice in writing requesting a Special General Meeting, the Hon. Secretary shall give not less than three and not more than five weeks notice of the agenda, in writing, to all Members and Associate Members, giving the date, time and venue.

6.10 The National Committee shall meet at least twice each year, namely during the Conference and immediately before the A.G.M.

6.11 The National Committee shall be empowered to form Special Committees whose objectives and reporting dates shall be fixed. All Members shall be informed of such formations within thirty days.

6.12 Minutes shall be taken of all meetings and copies circulated to the National Committee Members. A resume of important points arising from the A.G.M. or a Special General Meeting shall be published in the first Journal thereafter.

6.13 The Constitution may only be amended at the Society A.G.M. or at a Special General Meeting called for the purpose.

6.14 A Branch Constitution may only be amended at the Society A.G.M. or at a Special General Meeting called for the purpose.

6.15 General Meetings shall be conducted according to Standing Orders for General Meetings (see Appendix 1).

6.16 Associate and Family Members may speak on Motions but may niether become Officers or Branch Organisers, nor vote.

6.17 All voting decisions shall be by a simple majority of those entitled, present and voting.

6.18 Notices of Motion may only be made by fully paid Members, Branches, the National Committee or the Executive.

6.19 The Chairman or other Presiding Officer shall not have a vote except in the event of a tie, when he shall have the casting vote.

6.20 A Quorum of fifteen shall be required at the Annual General Meeting, two of whom shall not be National Committee Members.

6.21 A Quorum of twenty-five shall be required at a Special General Meeting.

6.22 A Quorum of five shall be required at a National Committee Meeting.

7 LIMITATIONS

7.1 The name of the Society may not be used without the permission of the Executive or Branch Officers.

7.2 The Society cannot accept liability for costs for any damage, fire, theft, legal fees, injury, etc.

7.3 The Society shall have the right to suspend or expel any Officer, Committee Member, Member, Family Member or Associate Member acting against the Aims of the Society, after full consideration of the case at a Special General Meeting called for the purpose. The Member shall have the right to present his case either orally and/or in writing and be represented by any other person of his choice.

7.4 The person so treated shall have the right to appeal to the Society at the A.G.M. immediately following.

8 INTERPRETATION

8.1 The O.U.G.S. shall be the sole interpreter of their Constitution.

8.2 Any matter not provided for in the Constitution shall be dealt with by the Officers acting individually or collectively as an Executive pending endorsement by the O.U.G.S. Annual General Meeting.

Appendix 1
STANDING ORDERS FOR GENERAL MEETINGS

1 QUORUM

A quorum of 15 members, two of whom shall not be National Committee Members, shall be required for the Annual General Meeting, and a quorum of 25 Members shall be required for a Special General Meeting. If, within 1 hour of the time appointed for the meeting to commence, a quorum is not present, the meeting will be dissolved.

2 AGENDA

(a) The agenda shall be prepared by the Chairman and Hon. Secretary.

(b) Items not on the Agenda will be introduced for consideration after the business on the Agenda has been completed.

3 THE CHAIR

(a) The Chairman of the Society shall take the chair.

(b) If the Chairman is absent a deputy shall be elected from among those present.

(c) The Chairmen shall vacate the chair should he wish to participate in the debate.

(d) The Chairman shall be responsible for keeping the meeting in order. When the Chairman speaks all members shall be silent.

(e) All business shall be addressed to the Chair.

4 SPEAKING

(a) The Chairman shall decide the right of priority in speaking. Precedence shall be given to whoever first 'catches the eye' of the Chairman.

5 MOTIONS

(a) A motion or amendment may be proposed by any Officer, National Committee, Branch or Member.

(b) The proposer shall have first speech and thereafter the motion shall be open for discussion. A motion may be withdrawn only with the consent of the meeting.

(c) The proposer of the motion shall have the right to sum up on the debate immediately before the vote is taken. He may waive this right, in favour of another or absolutely.

(d) There shall be no new information or points of information during a summing-up speech.

(e) There shall be only one motion or amendment before the meeting at any one time.

(f) Amendments may be tabled to any motion on the Agenda during the Meeting providing they do not substantially alter the motion.

6 PROCEDURAL MOTIONS

The following procedural motions may be put and there shall be allowed only one speech for and one against.

(a) A vote of no confidence in the Chairman.
(b) A challenge to the Chairman's ruling.
(c) A motion for a temporary Chairman.
(d) A motion for temporary adjournment of the meeting.
(e) That the matter lie on the table.
(f) That the matter be referred to the National Committee or Special Committee for investigation or re-examination.

7 The following procedural motions shall be put to the meeting without discussion:
(a) That the motion not be put.
(b) That the motion be now put.
(c) That the motion be voted on in parts.
(d) That the Standing Orders be suspended in whole or in part.
(e) That the meeting be closed.

8 Procedural motions shall have a proposer and seconder.

9 Procedural motions shall not be proposed while any member is speaking on a point of order or information, or during the taking of a vote.

10 VOTING
(a) Each Member, excluding the Chairman, shall exercise one vote, but the Chairman shall have the casting vote.
(b) Voting for a motion shall be by show of hands.
(c) For a motion to succeed a simple majority will be deemed necessary.

11 GENERAL RULES
(a) Points of information may be raised by any Member providing that the speaker holding the floor signified his intention of giving way.
(b) Points of order, which have precedence over all other business except the act of voting (unless they concern the actual conduct of voting) may be raised by any Member. They must be framed as a question to the Chairman and shall be related only to the conduct of the meeting.
(c) No question once decided may be re-opened at the same meeting.
(d) Any suspension of the Standing Orders shall apply for the duration of the matter under discussion only.
(e) Amendments to these Standing Orders shall require a two-thirds majority of those present and voting, for or against.
(f) If an amendment is accepted by the proposer of the motion, then the motion remains his. If it is not accepted and is carried, then the substantive (amended) motion becomes the property of the mover of the successful amendment.
(g) Amendments tabled second, and subsequent to a motion may fall by virtue of the first amendment being carried or accepted, and the Chairman shall rule on this.

RECOMMENDED O.U.G.S. BRANCH CONSTITUTION

1 NAME

1.1 The Organisation shall be called the ..... Branch of the Open University Geological Society.

2 AIMS

2.1 To foster a corporate identity for Members of the O.U.G.S. in the area.

2.2 To promote educational and social interests of Members.

2.3 To establish and maintain good relations with organisations having common interests.

3 MEMBERSHIP

3.1 Membership shall be open to all Members, and Associate and Family Members, of the O.U.G.S. who are best served by the ..... Branch.

4 FINANCE

4.1 Each Officer shall keep a record of his accounts.

4.2 The Branch Organiser shall prepare and present an audited statement of the overall accounts at the Branch Annual General Meeting.

4.3 The Branch shall have the power to raise funds from any sources.

5 GOVERNMENT OF THE BRANCH

5.1 The Officers of the branch shall be:

Branch Organiser
Committee Members as required.

5.2 The Officers shall be elected from among Branch Members, by consenting nomination by two Members and a majority vote, at the Branch Annual General Meeting to serve for one year and be eligible for re-election.

5.3 The Committee Members may be elected to carry out specific functions as decided by the Members at the Branch Annual General Meeting. Titles may be assigned to define the functions as necessary.

5.4 The Branch Organiser shall represent the Branch on the O.U.G.S. Committee, or shall nominate a deputy in his absence.

5.5 The Officers shall act individually or collectively as a Branch Committee to deal with routine matters within the terms of reference given by the Branch and in accordance with the Aims of the O.U.G.S.

5.6 When a vacancy occurs by reason of resignation, disqualification or death of an Officer, a replacement shall be appointed by the Branch to fill the vacancy until the next Branch Annual General Meeting, at which the replacement shall retire and be eligible for re-election.

6 PROCEDURE AND BUSINESS

6.1 There shall be a Branch Annual General Meeting in ..... each year.

6.2 The Branch Organiser shall give six weeks notice in writing to all Branch Members, and the O.U.G.S. Hon. Secretary, of the date, time and venue of the meeting.

6.3 Members shall give the Branch Organiser at least four weeks notice in writing of any motions, proposals or matters they wish to have placed on the Agenda for the Branch Annual General Meeting.

6.4 The Branch Organiser shall send out the Agenda for the Branch Annual General Meeting at least two weeks before the Meeting to all Officers, Committee and Members. Amendments to motions may be submitted before or at the Meeting.

6.5 The Officers shall retire at the Branch Annual General Meeting but be eligible for re-election.

6.6 The Auditor shall be appointed at the Branch Annual General Meeting for the next year.

6.7 A Special Branch General Meeting may be called at the request of the Committee, Branch Organiser or six Branch Members.

6.8 Within two weeks of receipt of notice in writing requesting a Special Branch General Meeting, the Branch Organiser shall give not less than three and not more than five weeks notice of the Agenda in writing, to all Branch Members and Associate Members, giving the date, time and venue.

6.9 Every field trip, lecture or other gathering shall be considered a Branch Meeting during which the business of the Branch may be conducted.

6.10 The Branch Organiser shall give two weeks notice of any business to be dealt with at Branch Meetings.

6.11 A Chairman shall be elected from among the Members present if business is to be conducted formally.

6.12 The Branch Constitution may only be changed at the O.U.G.S. Annual General Meeting.

6.13 Notices of Motions may only be made by Members.

6.14 Only Members may vote (Associate and Family Members may not vote).

6.15 All voting decisions shall be by simple majority of those entitled, present and voting.